



The Rise of Avatars in Positive Psychology:

Enabling Military Cultures in a 3D World for Strengths of Character Development

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The Rise of Avatars in Positive Psychology: Enabling Military Cultures in a 3D World for Strengths of Character Development

Andrew Stricker, Ph.D.
Air University

Mike McCrocklin
Air University

Cynthia Calongne, D.CS.
Colorado Technical University

Toni Scribner
Air University

Jeanne Holm
NASA/Jet Propulsion Laboratory

War is the realm of physical exertion and suffering. These will destroy us unless we can make ourselves indifferent to them and from this birth or training must provide us with a certain strength of body and soul. (Clausewitz)

Introduction

The outboard motor sputtered to a stop as the tour boat eased up next to a wooden pier. I stepped off and quickly surveyed the shoreline of an inlet surrounded by rocky cliffs and rolling hills.¹ Looking ahead I spied a narrow pass with a stone monument among a jumble of rocks—the destination of my journey. The sky is clear blue and scruffy laurels mark my path to the stone monument. I catch a glance at hot springs nearby and move closer to read an inscription on a stone monument marking the entrance to the pass from the sea:



Figure 1. Statue of Leonidas.

*'Stranger, tell the Spartans
that we behaved as they
would wish us to, and are
buried here.'*

I press a button and
download a media
narration app to my
mobile device:

For no man ever proves himself a good man in war
unless he can endure to face the blood and the

slaughter,
go close against the enemy and fight with his hands.

Here is courage, mankind's finest possession, here is
the noblest prize that a young man can endeavor to
win,
and it is a good thing his city and all the people share
with him
when a man plants his feet and stands in the
foremost spears
relentlessly, all thought of foul flight completely
forgotten,
and has well trained his heart to be steadfast and to
endure,
and with words encourages the man who is
stationed beside him.

Here is a man who proves himself to be valiant in
war.
With a sudden rush he turns to flight the rugged
battalions
of the enemy, and sustains the beating waves of
assault.
And he who so falls among the champions and loses
his sweet life,
so blessing with honor his city, his father, and all his
people,
with wounds in his chest, where the spear that he
was facing has transfixed
that massive guard of his shield, and gone through
his breastplate as well,
why, such a man is lamented alike by the young and
the elders,

¹ Perspective offered by co-author Andrew Stricker.

and all his city goes into mourning and grieves for his
loss.

His tomb is pointed to with pride, and so are his
children,
and his children's children, and afterward all the race
that is his.

His shining glory is never forgotten, his name is
remembered,
and he becomes an immortal, though he lies under
the ground,
when one who was a brave man has been killed by
the furious War God
standing his ground and fighting hard for his children
and land.

But if he escapes the doom of death, the destroyer
of bodies,
and wins his battle, and bright renown for the work
of his spear,
all men give place to him like, the youth and the
elders,
and much joy comes his way before he goes down to
the dead.

Aging, he has reputation among his citizens. No one
tries to interfere with his honors or all he deserves;
all men withdraw before his presence, and yield
their seats to him,
the youth, and the men his age, and even those
older than he.

Thus a man should endeavor to reach this high place
of courage
with all his heart, and, so trying, never be backward
in war.

-Tyrtaeus of Sparta, c. 630 BC²

I learn the monument honors the warriors who
stood unwavering before the mighty Persian
army of Xerxes in 480 B.C. on its way to Athens.
The only obstacle between Xerxes' vast army
and Athens was a small Greek army led by
Leonidas and his 300 Spartans. Leonidas and
his warriors held the mighty Persian army up at
The Hot Gates mountain pass for a week until a
traitor revealed a hidden passage around the

pass which was used by Xerxes' army to come
up behind Leonidas. Recognizing his
entrapment, Leonidas knew he could make but
one last stand, a position he choose out on an
open mound to fight "right in the line of
history" as Spartans were raised from birth to
carry out their orders in the face of danger
without regard for personal risk in service to the
highest military virtues (Golding, 1966).

I paused and drew myself back to reflections
about today's warriors. Accompanying the first
unit of Marines in the assault on the city of
Fallujah in November 2004 the American
journalist Robert Kaplan wrote that what they
had going for them was their 'warrior spirit'
(Coker, 2007). My journey to this place had
started from a desire to learn more about the
history of this warrior spirit and the nature of its
inheritance by warriors today. A natural
starting point in my mind was to study the
events at the ancient battle of Thermopylae
(*The Hot Gates*) where the strengths of
character displayed by Leonidas and his 300
Spartans seem to transcend time itself and have
become immortal by repeated retellings
generation after generation among soldier
guardians. I could not readily travel to southern
Greece so I undertook a tour offered by the U.S.
Air Force in an open virtual world to the
simulated battle site. The monument before
me stands in a digital landscape filled with
motion, sights and sounds so real that I find
myself readily able to suspend disbelief that I
inhabit a virtual world. I easily let go of
disbelief and immerse into an experience very
unique indeed where historic battles can be
melded with social media in cyberspace to
support the development of military minds
unimaginable just a few years ago. In a way, I
have Leonidas to thank for the freedom to learn
about the soldier-guardian mind, spirit, and
strengths of character.

What is a Soldier Guardian?

In *The Republic*, Plato (c. 427-347 BC) lays out
his fundamental principles for the conduct of

² In Bergh's Poetoe Lyrici Groeci, 3d ed., Leipsic,
1866.

human life in civic and individual roles. Ideally, he argued, civic leadership is described by three roles: rulers, soldiers, and people (consisting of farmers, merchants, and others). At the civic level rulers should be known for wise decisions, soldiers for courageous actions, and all people for moderated desires. Plato also believed that for society to work well each person, regardless of role, ought to mirror all the civic strengths of character: wisdom, courage, and moderation. Plato further argued that the development of these strengths of character is the enduring purpose of education and the foundation of morality. The concept of guardian was introduced by Plato to address the additional responsibilities of rulers and soldiers. Rulers exercise guardianship by resolving disputes and establishing public policy; and, soldiers by defending the state against enemies without regard for personal risk. Both rulers and soldiers were expected to seek the welfare of the state in what is best for all citizens. For Plato, the development of soldier guardians involved rigorous training and the maturation of personal traits distinguished by temperamental attitudes toward sound thinking and skills for judging what is true and best.

Since Plato's time the development of strengths of character desired for the soldier guardian have been vigorously examined and debated. Contemporary interest in the development of the warrior, since Clausewitz, has similarly placed importance on strengths involving body and soul. Soul, in this sense, reflects mental toughness of the warrior to go the extra mile and to repeatedly be willing to do so over and over again when duty calls. Warriors returning from Iraq and Afghanistan have readily shared the importance of physical fitness is necessary but not always sufficient alone for stamina in the face of war. Warriors also speak of the importance of an inner strength, consisting of toughness of soul, for going the extra mile or beyond the call of duty; and, if called upon, give the ultimate sacrifice. Christopher Coker (2007), in *The Warrior Ethos: Military Culture and the War on Terror* refers to the source of

this strength as a "warrior ethos," a set of character values and beliefs that defines a warrior. Coker points to Achilles as an example of the Western warrior with character values like self-sacrifice, valor, and a willingness to go beyond the call of duty. Coker argues that contemporary culture has "hollowed out" the warrior ethos by failing to honor those values. He believes we have become a society skeptical of those who adhere to the warrior code and suspicious that those who do may love war too much. The erosion of the warrior ethos, Coker contends, occurs at great peril to societies still dependent on these values in those they send to fight, for it is the warrior's ethos that limits atrocity and the deliberate targeting of civilians.

Coker also contends that difficulty with accounting for the well-spring of "warrior ethos" or soul-strength might explain why warriors can be deeply ambiguous figures in society. After all, in modern society seemingly motivated by self-interests, how do citizens of today become soldier guardians possessing strengths of character behind will and skill to answer the call to duty, not just once, but for a lifetime of service? Certainly the events of 9/11 remind us that a citizen can rise to an occasion calling for selfless service in times of crisis. More telling, however, is what accounts for resilience in selfless service by a soldier guardian? What is the wellspring of the strengths of character, as described by Plato and exemplified in warriors like Leonidas, that supply the will and skill to serve a lifetime and give the ultimate sacrifice when called upon because the warrior knows other people matter? What accounts for specific positive strengths of character in a soldier guardian, such as persistence, hardiness, resilience, bravery, to name a critical few? How best can future soldier guardians be shaped in the development of a military mind and warrior ethos and acquire positive strengths of character by enabling military institutions? Research from the relatively young field of positive psychology is offering compelling

insights to these questions for military educators.

Positive Psychology and the Military Mind

It has been 12 years since Martin Seligman and Mihaly Csikszentmihalyi (2000) introduced the field of positive psychology for supporting empirical studies across social and behavioral sciences of what actions lead to well-being, to positive individuals, and to thriving communities. In their view, psychology is not just the study of pathology, weakness, and damage; it is also the study of strength and virtue (Seligman & Csikszentmihalyi, 2000). Christopher Peterson (2006) offered the definition of positive psychology as “the scientific study of what goes right in life, from birth to death and at all stops in between” (p. 4). Positive psychology emphasizes positive states and traits towards “making normal people stronger and more productive and making high human potential actual” (Seligman & Csikszentmihalyi, 2000, p. 8). Csikszentmihalyi realized the need for a positive psychology in Europe during World War II when he witnessed the dissolution of the existing worldview. He shares:

“I noticed with surprise how many of the adults I had known as successful and self-confident became helpless and dispirited once the war removed their social supports. Without jobs, money, or status, they were reduced to empty shells. Yet, there were a few who kept their integrity and purpose despite the surrounding chaos. Their serenity was a beacon that kept others from losing hope. And these were not the men and women one would have expected to emerge unscathed: They were not necessarily the most respected, better educated, or more skilled individuals. This experience set me thinking: What sources of strength were these people drawing on? [...] there are human strengths that act as buffers against mental illness: courage, future

mindedness, optimism, interpersonal skill, faith, work ethic, hope, honesty, perseverance, and the capacity for flow and insight, to name several. Much of the task of prevention in this new century will be to create a science of human strength whose mission will be to understand and learn how to foster these virtues in young people.” (Seligman & Csikszentmihalyi, 2000, pp. 6-7)

Csikszentmihalyi’s proposal for a science of human strength has not gone unnoticed by military psychologists. Research from the field of positive psychology is increasingly being applied by enabling U.S. military institutions to strengthen strengths of character associated with the military mind and civic virtues such as bravery, optimism, persistence, enthusiasm, fairness, honesty, leadership, self-control, teamwork, citizenship, civility, work ethic, to name a few³. Michael Matthews (2008) has offered the following suggestions for the application of positive psychology to the military (p. 295):

- Developing predeployment training protocols to build resilience of soldiers to combat-related stress;
- Utilizing positive psychology methods to assist in reintegration following combat deployments;
- Examining how character strengths might interact with cognitive factors to facilitate tactical, operational, and strategic decision-making;
- Facilitating selection and training of elite combat units;
- Evaluating the efficacy of positive psychology-based intervention in treating PTSD and related disorders;
- Educating government agencies and healthcare organizations on the

³ The reader is referred to Samuel Huntington’s more complete description of the military mind (1985, pp. 59-79).

potential value of positive psychology in working with their target populations;

- Conducting research to identify best practices for application to military families; and
- Exploring the extent and nature of posttraumatic growth (PTG) that may follow exposure to combat or other dire situations.

Ultimately, social interaction plays a significant role in the establishment and sustainment of positive traits in individuals. How we group together and interact can influence the way we think about ourselves and others even within large institutions. Yet, also in modern society, we live in small groups, we learn in small groups, we work in small groups, we play in small groups, and we worship in small groups (Peterson, 2008, p. 279). A group, or collection of groups, that becomes enduring and structured, forms the basis of an organization that carries a body of traditions and customs; and, in many cases, serves to instill a shared culture across generations. U.S. military organizations, as multi-generational shared cultures, can be purposefully influenced or shaped with the application of positive psychology. Don Snider (1999), a professor of political science at West Point, offered the following definition of military culture (p. 14):

“...military culture may be said to refer to the deep structure of organizations, rooted in the prevailing assumptions, norms, values, customs and traditions which collectively, over time, have created shared individual expectation among the members. Meaning is established through socialization to a variety of identity groups that converge in operations of the organization. Culture includes both attitudes and behavior about what is right, what is good, and what is important, often manifested in shared heroes, stories, and rituals that promote bonding among the members.”

The above definition places importance on shared experiences, heroes, stories, and rituals for socializing and group bonding of new members into a shared culture. Many of these activities can be purposefully designed and enabled by military institutions in support of the development of strengths of character.

Features of Enabling Institutions

Peterson (2006) believes there is also a role for positive traits for institutions. He argues that not only do strengths of character contribute to the stated goals of the institution, they also contribute to the fulfillment of the individuals within it. He highlights the importance of institutional-level virtues as the moral characteristics of the group as a whole:

“...institutional-level virtues need to be an enduring part of the institutional culture. A school might happen to employ a number of teachers dedicated to the intellectual growth of students, but if the school does not have practices in place that allow such dedication to survive personnel turnover, there is no institutional-level virtue. Institutional-level virtues serve the moral goals of an organization and not simply its bottom line, whether this be profit, power, or persistence...The institutional-level virtues of most interest in the present context are those that are cultivated and celebrated and that serve as a source of identity and pride for the organization’s members. To the degree that membership in an organization is fluid, members point to the institutional-level virtues as reasons to remain a member...I speculate that a good organization can inspire its members to be more than they are—to reveal strengths of character that are dormant or to create new ones that allow them to rise to the occasions deemed to be

important by the organization.” (pp. 280-299).

Peterson (2006) offers the following widely valued institutional-level virtues (p. 298):

- *Purpose*: a shared vision of the moral goals of the organization, which are reinforced by remembrances and celebrations
- *Safety*: protection against threat, danger, and exploitation
- *Fairness*: equitable rules governing reward and punishment and the means for consistently enforcing them
- *Humanity*: mutual care and concern
- *Dignity*: the treatment of all people in the organization as individuals regardless of their position

There is a reciprocal relationship between the actual practice of institutional-level virtues and ability to contribute towards the development of strengths of character in individuals. Congruence and contiguity, between espoused institutional-level virtues and actual conduct among members of the group, matters in everyday practices for establishing and maintaining a positive culture for developing strengths of character. Contiguity, or level of being able to “touch” or interact with institutional-level virtues in contiguous and situated activity, matters. This can be particularly critical when introducing and acclimating new members to the group. This brings up consideration for the role of social media and emerging digital technologies in cyberspace to introduce and offer contact with military cultures whereby prospects exist to engage individuals in social networks in continuous and situated ways for developing strengths of character.

Application of Positive Psychology to Introduce Military Cultures and Institutional-Level Virtues Using Game-Based Learning

Digital natives will soon become a majority in an emerging millennial generation U.S. military. Questions arise about how best to develop future warriors in character development wherein the majority of recruits will be used to the instantaneity or “always on” of information access, sharing; and where learning occurs in mobile, collaboratively-driven digital “third space” (neither home, nor school/work).⁴ Of course, what comes to mind is the use of cyberspace. And indeed, many of today’s future military recruits are now participating in open-cyberspace U.S. military cultures made available in 3D worlds, such as the U.S. Army’s massively multiplayer *America’s Army* and the U.S. Air Force’s *Huffman Prairie-MyBase* virtual regions in the metaverse of Second Life.

America’s Army. *America’s Army* is a multiplayer, team-oriented, first-person shooter game with the participant acting as a soldier, at the squad level, in the U.S. Army.



Figure 2. View from *America’s Army*.

America’s Army promotes adherence to the U.S. Army’s seven core values. According to Colonel E. Casey Wardynski, the director and originator of the *America’s Army* project:

“Of central importance, within a game the Army would be able to demonstrate the interplay between Soldiering and values. The Army’s cornerstone values of duty, integrity, honor, loyalty, selfless

⁴ The concept of “third space” was suggested by Robert Godwin-Jones (2005).

service, courage, and respect for others would shape player progression and game experiences. In this way, such a game would convey an understanding of the context within which our nation confers its sanction to Soldiers to employ force in defense of freedom. Moreover, through its role-playing capacity, this game would help players make connections between life-course decisions and life-course outcomes. Thus, a well-executed game would put the Army within the immediate decision-making environment of young Americans.” (p. 7)

The game is structured for 10-minute missions between two teams of players interacting via avatars. The word “avatar” comes from a Sanskrit term meaning a god’s embodiment on Earth, and has been adopted universally in English to describe a person’s representation in a virtual world (Pearce, 2009, p. 21). Team members can communicate using audio headsets or by online chat. Missions are modeled after real-life Army divisions and depict scenarios involving combinations of actual training sites to fictional locations. Roles for players to assume include special forces, medical technicians (combat life savers), armored infantry, regular infantry, military police, among others. Interestingly, *America’s Army* provides for optional medical training on real-world procedures. Players have to complete a virtual medical training course to assume the role of a combat life saver. The course instructs players on how to evaluate and prioritize casualties, control bleeding, recognize and treat shock, and administer aid when victims are not breathing. Two *America’s Army* players have reported using the training they received in the game to save lives in real-life emergencies.

In 2005, the *America’s Army* developers partnered with the Software Engineering Directorate and the Army’s Aviation and Missile Research Development Engineering Center in

Huntsville, Alabama, to manage the commercial game development process and use the *America’s Army* platform to create government training and simulations. “America’s Army has pushed to reuse the same elements for many purposes,” said Colonel Wardynski, originator of the Game, “We can build one soldier avatar and use it again and again. When we build something in America’s Army, the U.S. government owns it completely ... and [it] can therefore be used for any application or use of the game. So costs keep going down...After AA went live, requests started coming in to use the game for purposes other than recruiting, such as training” (p. 7). Later, the commercial software was repurposed to meet the needs of Soldiers preparing for deployment. Customized applications are used by many different Army and government organizations including the JFK Special Forces School, the Army’s Chemical School, and NASA.

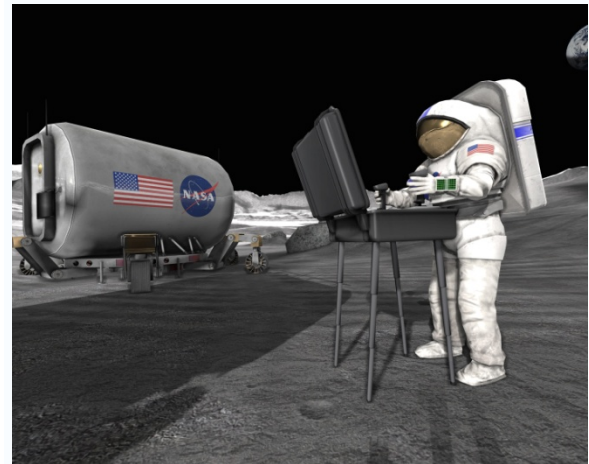


Figure 3. Virtual view from NASA game.

U.S. Air Force’s *Huffman Prairie-MyBase* Virtual Regions in Second Life

Metaverse of Second Life. Second Life was opened to the public on June 23rd, 2003. Since its inception in 2003, the metaverse of Second Life has become the world’s largest open virtual world with over a million registered users. The Second Life metaverse (3D world) physically resembles the real world. It consists of interlinked regions containing land, water, and

air. Physics is applied with gravity, weather, and a sun and moon that regularly cut across the horizon. Each region has an area of 65,536 Second Life square meters (about 16 virtual acres of land). Second Life regions are both geographical and administrative units and are governed by rules and regulations that may change from region to region. There is also a Teen grid reserved for Second Life members between the ages of 13 and 17. Residents of Second Life are the creators of the various virtual regions. (Rymaszewski, et al., 2008, pp. 4-6, 332).

Air University educators designed the U.S. Air Force's open virtual regions in Second Life to provide for collaborative prototyping among participants from industry, higher education, and government organizations to explore, design, and test the innovative use of social media and game-based learning for ways to enhance learning and introduce military cultures in 3D worlds to the public (Hughes & Stricker, 2009; Stricker & Clemons, 2009). Importance is placed on architecture for community participation that can support inhabitable, shared-situated places suited for collaborative and emergent design-build prototyping activities. Our Air University educators have discovered that immersive virtual reality (IVR), offered by virtual worlds such as Second Life, can provide an inhabitable place, offering geographical independence for user-centered social networks, to collaboratively design, test, and improve prototypes to enhance learning and introduce the public to the various Air Force military cultures.

IVR is traditionally defined by the equipment and hardware interface to the virtual environment, i.e., wearing a head-mounted display device that constrains the user's vision within the virtual environment (Mizell, Jones, Slater, & Spanlang, 2000) or a spherical dome for directing and limiting the user's perspective (Bednarz, Caris, & Dranga, 2009). When the game Doom was created, it was considered an

immersive game experience and the first game to truly frighten players (Fullerton, Swain & Hoffman, 2004). It did not matter that the graphical rendering of the walls was less detailed or that a display monitor was used to view the game world. As users raced through the game, the sense of realism, the atmosphere of menace (Rouse III, 2005), and immersion in the game's activities were contributors to Doom's success. Salen and Zimmerman (2004) in *The Rules of Play* noted the immersive fallacy and that this sense of engagement and immersion is less dependent on the environment or a sensory replication of reality, but is fostered through the engagement of play and the process of metacommunication. This paper refers to IVR by the user's sense of presence, attentiveness and interaction within the shared virtual environment. It favors metacommunication (Salen & Zimmerman, 2004) and constructionism (Bruckman, 1997; Kafai & Resnick, 1996) over the sensory experience acquired by a head-mounted display device with tracking.

Meredith Bricken (1991) and Hilary McLellan (1991) argued IVR can be very supportive of situated and constructivist learning.⁵ IVR provides the means for a person to enter a virtual spatial multi-sensory environment and embody it in such a way as to actively inhabit, interact, and create the next event (Bailenson et al., 2008 and Walser, 1992). Situated learning (Lave and Wenger, 1991; Wenger 1998) posits that how people learn is very much a social process involving communities.⁶ Social and cultural values and practices are embedded in what people learn. A related learning theory, constructivist theory (Brown, et al., 1989;

⁵ In the late 1980s Jaron Lanier first coined the term "virtual reality" to describe interactive computer-generated three-dimensional immersive displays (Lanier, 2001; Rheingold, 1991, pp. 15-16). Much progress has occurred since the first commercially-available multiparticipant or multiuser virtual reality (VR) system was introduced by Jaron Lanier's "Reality Built For Two" or RB2 (McLellan, 2004).

⁶ See also Bransford, et al., 1999.

Bruner 1986; & Piaget, 1977) places importance on how people construct understanding of knowledge. People construct understanding based on life experiences and beliefs to help associate new knowledge. Learning, in the constructivist view, is very iterative, via active-experiential engagement, to associate existing understanding with new information. According to Bricken (1991) IVR learning environments can be designed to be experiential and intuitive; providing learners with control over time, scale, and physics for a shared experience and information context supporting interactive hands-on learning, group projects and discussions, field trips, simulations, concept visualization, and to observe from many perspectives.

A related important design quality of IVR learning environments is “worldness.” This concept addresses the degree of how well IVR participants can situate in a learning community and co-engage in the collective creation of belief about the coherence, completeness, and consistency within the immersive virtual reality environment, regarding its’ aesthetics, and rules (Pearce, 2009, p. 20).

An IVR situated community, named the Global Learning Forum (GLF), was designed and established by Air University educators in support of prototyping for learning innovations using social media and 3D worlds. A key feature of GLF is dependence on bridging “weak interpersonal tie” social networks for obtaining the maximum channels through which novel ideas and information are gathered from the broadest outreach of social and cultural perspectives.

GLF acquaintances bring different experience levels with inhabiting, navigating, organizing, and creating virtual space via embodiment of an avatar. People shape and dress an avatar’s virtual body intentionally to convey gender, body proportions, style and dress appearance to express a desired “in-world” persona. Behind GLF community interactions, a person is

in command of an avatar. On occasions, autonomous agents, which can look and behave like human-controlled avatars, are used as co-player agents in serious games for learning prototyped by the GLF community.

GLF members have taken positive psychology-derived constructs, such as character strengths (e.g., bravery, optimism, persistence, enthusiasm, fairness, honesty, leadership, self-control, and teamwork), and specifically targeted them for cultivation, using real-world challenges to train and educate the next generation of warriors. Strengths of character associated with coping and resilience, when facing novel and challenging situations, are addressed in the GLF game-based prototypes for intact-team learning. GLF members have designed games for learning to support making visible the morally valued styles of thinking, feeling, and acting that can contribute to positive states and successful adaptations to challenges and in the pursuit of individual and collective team excellence.

Air Force Regions in Second Life Supporting the Introduction of Military Cultures and Games for Learning

Each of the regions described below were designed by U.S. Air Force educators, in collaborative effort with other GLF members, across various cultural settings for prototyping learning innovations and introducing the public to military cultures.

Huffman Prairie. The focus of this region is on proof-of-concept or “skunk works” for exploring the art-of-the-possible with collaborative communities to innovatively enhance learning, instruction, and discovery. Visiting faculty members have access to virtual office space, machinima studios, electronic book publishing tools and learning design laboratories. A Virtual Educational Technology Support Center (VETSC) offers resources and demonstrations for faculty in the use of virtual worlds. Several publications are available on learning and

assessment sciences in the form of virtual booklets. An illustrative virtual digital library (Arthur's Reading Room) is also located on this region. Visitors can also take a tour of twelve learning environment prototypes using the teleport tour board located in front of VETSC.



Figure 4. Virtual view of Huffman Prairie and the Virtual Educational Technology Support Center.

MyBase. This region is dedicated to sharing the history and learning about the U.S. Air Force. Many of the displays are designed to be interactive. The public can engage in various simulations and activities at MyBase:

- Fly a P51C Mustang (a virtual replica of the aircraft used by the Tuskegee Airmen in WWII); join the Huffman Prairie Mustang Aero Club (The Huffman Prairie Mustang Aero Club is for anyone interested in virtual flying. Of particular interest to members is the P51 Mustang WWII pursuit fighter used by the Tuskegee Airmen)
- Try out a simulation of a Challenge Course and shooting range
- Watch a movie in the base theatre and dance to U.S. Air Force band music in the club
- Visit the Basic Military Experience area and try out the classrooms, dorm, and dining displays
- Stop by the Museum and see featured displays about the U.S. Air Force
- Check out the Visitor and Administration Center, located in the center of the MyBase region, where an

U.S. Air Force website can be accessed, by clicking on a virtual computer, to interact with a person to discuss opportunities with the U.S. Air Force.

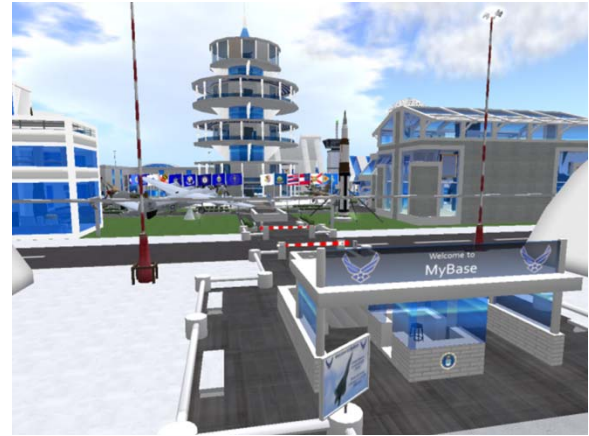


Figure 5. Virtual view of MyBase public front gate entrance, Air Force museum and visitors center.

MyBase Zeta, Lance P. Sijan Leadership Range.

This area of MyBase Zeta serves as a test bed for simulation gaming for education in support of scenario-based learning and authentic assessment practices. Explore the game set that supports the Operation Relief Worker Rescue Challenge simulation game conducted on the Captain Lance P. Sijan Leadership Range on the region. The current game set configuration is used to instruct teams on interdependent leadership (Hughes & Stricker, 2009). The set includes an abandon U-boat base, remote village, underground tunnels, warehouses, and an Air Operations Center for game officials.



Figure 6. Virtual view of Captain Lance P. Sijan Leadership Range supporting 3D world games for learning.

MyBase Zeta, Airfield. This area of MyBase Zeta contains a virtual airfield supporting a number of representative Air Force aircraft, piloted aerial vehicles, skydiving, and aerial tours. An air control tower supports virtual flights along with several aircraft hangars. Aircraft squadrons, color-coded for teams, are also provided in support of the Lance P. Sijan Leadership Range game scenarios. Virtual C-130s can also be launched from this area and can fly missions across the Air Force regions and in support of game scenarios. Visitors are also encouraged to visit the virtual Air Operations Center (AOC) located on the far northeast area of the airfield. The AOC is located on the 2nd floor of the range operations depot building.



Figure 7. Virtual view of MyBase Zeta airfield.

Huffman Prairie Chi. Virtual building arenas and tools are provided for constructing educational holograms (temporary virtual objects packaged for on-demand use). Four public sandboxes are also provided for users to temporarily build or “rez” objects. Also, a digital library and building resources are available beneath the hologram arenas. The Global Learning Forum (GLF) Event Hall, a large hologram, is also “rezzed” on the region in support of events. The GLF is a virtual collaborative community of educators from across industry, government, and higher education.



Figure 8. Virtual view of Huffman Prairie Chi and the GLF Event Hall hologram.

Huffman Prairie Omega. Resources on this region support scalability assessments and sustainability analysis for educational technology innovations. Also, hologram displays are available for viewing (located on Ayn Rand Space Station above HP Omega). At the memorial General Bernard A. Schriever rocket launch learning center you can take a 3-stage rocket to the Ayn Rand Space Station. The space station hosts several conference rooms, classrooms, faculty offices, and additional hologram displays. Several space-travel vehicles are also on display.

Visitors can ride a monorail and sky lift to access various resources available throughout the region. The monorail travels inside the mountain range wherein visitors can explore several 3D object resource repository collections. Visitors can obtain copies of the 3D objects from the collections. A visitor center is located on the eastside of the region along with an online status and communication board for contacting staff members for assistance.



Figure 9. Virtual view of Huffman Prairie Omega and the General Bernard A. Schriever Rocket Launch Learning Center.

Huffman Prairie Sigma. This region supports expedition challenge-based learning involving the use of real-life challenges wherein learners can apply knowledge and problem-solving skills while journeying towards a destination. Expedition challenges are designed to help learners uncover important relationships about applying knowledge. Visitors can experience a prototype expedition challenge in the form of a journey to Mars. The journey starts by riding a 3-stage rocket to a deep-space craft for the trip to Mars. During the expedition participants work on a challenge addressing options for future human flight in space. The rocket launch facility also contains additional information on the learning framework used for the challenges.



Figure 10. Virtual view of Huffman Prairie Sigma and the Mars Exploration Challenge Game launch facility.

Huffman Prairie Gamma. This region supports the exploration and prototyping of educational informatics applications. Educational informatics melds the study of informatics science with analysis of learning information and knowledge, to address the interface between technology, learning, and assessment sciences in the design of interactions between natural and artificial systems (Scheessele, 2007; Stricker, Lorenzi, & Scribner, 2009). As an interdisciplinary field, educational informatics, focuses on information, data, and knowledge in the domain of education—their storage, retrieval, and optimal use for problem-solving and decision-making in support of how people learn, instruct, and discover new knowledge.



Figure 11. Virtual view of Huffman Prairie Gamma depicting informatics tower, clinic and library.

Huffman Prairie, Machinima Studios. This area of Huffman Prairie supports the design and development of machinimas (Kelland, Morris, & Lloyd, 2005). Machinima is the art of making animated films within a realtime virtual 3D environment. Techniques employed in the making of a machinima helps to simplify the process of developing a live-action film. Machinimas can be produced much faster than can be obtained from the use of traditional animation methods.

Airfield hangars on Huffman Prairie are used to house virtual cameras, props, sound stages, and an editing studio. Samples of each are on display for visitors along with design resources used in past machinima productions.

Visitors are also encouraged to visit the design studio facility located opposite of the machinima hangars. The design studio facility is used to support virtual studio events to plan for large innovation projects. Included in the design studio area is an auditorium and digital library.



Figure 12. Virtual view of Huffman Prairie depicting Design Studio facility and Machinima stages.

Design Focus of Air University GLF Games for Learning

More than ever in the history of warfare, war fighting can span across mental, economic, social, cultural, religious, and political systems shaping and influencing complex battle spaces. Twenty-first century warfare requires a warrior to excel in mental and strengths of character associated with the ways of knowing, deciding, and acting to successfully obtain both nonlinear and non-kinetic outcomes. Our Air University educators believe warrior strengths of character to know, decide, and act are cognitively, affectively, and socially developmental in nature.

Game scenarios are designed to help participants perceive and value the interdependencies among various strengths of character such as self-control and teamwork in the culture and context of application. Game participants can experience the military mind adaptations necessary across cognitive and affective ability areas involved with:ⁱ

- Quality of awareness. How well the warrior interprets and values information in his/her possession into a mental view of the battle space that includes, for instance mission constraints, environmental factors, time-space relationships, and the capabilities and intentions of forces.

- Quality of decisions. How well the warrior's choices build on his/her awareness and understanding and how appropriate those choices are for the situation at hand.
- Quality of understanding. How effectively the warrior infers meaning from his/her mental view of the battle space, including recognition of patterns, cause-effect relationships, dynamic features, and opportunities and risks.

No less true in previous wars, but certainly true with asymmetric qualities of 21st century warfare, the cycle of innovation involving adaptation and counter-adaptation among adversaries seeking to create greater awareness and those seeking to evade or mislead it, makes it increasingly important for warriors to successfully adapt in innovative ways. Unfortunately, however, without developing strengths of character for battle-wise sense making (situational awareness) and judgment in the face of uncertainties, the advantages of force can go unrealized, and in some cases, can actually increase the fog of war when the warrior is not prepared in the development of strengths of character to perform and think well across the battle space domains.ⁱⁱ

At a high level, sense making and judgment under uncertainty for the warrior involves translating and interpreting, often from limited or incomplete data, an opponent's action, to make sense of its meaning, while recognizing the personal, social, cultural, and historical contexts in which the action arises.ⁱⁱⁱ With battle-wise sense making and judgment, the warrior puts the opponent's actions into a meaningful and insightful framework after considering multiple perspectives and estimates with wisdom the most likely 2nd and 3rd order cause-and-effect chains involved with options. A 21st century warrior with wisdom is alert to what is taken for granted, assumed, or overlooked and uses mature recognition that any action taken to address uncertainty involves a point of view.

Our games for learning are designed to help participants experience and understand why shifting perspectives helps to expose questionable and unexamined assumptions, conclusions, and implications. Considering different perspectives involves the discipline of deliberately seeking out and interpreting multiple perspectives, which is a distinctive characteristic of adaptive experts.^{iv} Novices, on the other hand, lack the ability to deliberately take and consider multiple perspectives and generally do not discern that understanding something in one cultural context does not preclude understanding it in other ways.^v This kind of self-knowledge--strength of character for the warrior is a key facet of sense making and judgment under uncertainty because it involves habits of mind to consider multiple perspectives, across cultural contexts, to develop more understanding and be better able to see beyond the obvious when action or solutions are not immediately known.^{vi} The critical factor with both sense making and judgment under uncertainty for the warrior is not only possessing access to information but also knowing how to think and perform well, with wisdom, when a member of a group; and to act decisively under challenging conditions. When strengths of character are purposefully developed in teams of warriors it becomes possible to harness the full power of shared awareness, perspectives, and thinking necessary for 21st century warfare.

Conclusion

To be sure, even with precision weapon systems offered by modern warfare technology, the warrior remains the most lethal weapon system on the modern battlefield, and is pivotal in the decision chain to know, decide and act wisely and decisively. For that reason, the apex of decisive advantage with force is ultimately dependent on the quality of how future warriors are developed in strengths of character in support of battle-wise sense making and performance.

As I step back onto the tour boat and look once more at the monument to Leonidas and the 300 Spartans off in the distance, I sense others will come this way to learn from the past to better shape the future. *'Stranger, tell the future that we behaved as they would wish us to.'*

Disclaimer

The opinions and viewpoints expressed in this paper are solely those of the authors and do not reflect official policy or position of NASA (Jet Propulsion Laboratory), Colorado Technical University, the US government or the Department of Defense (DoD), the United States Air Force, or Air University. Cleared for public release (AETC-2010-0165).

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ⁱⁱⁱ Edward A. Smith, "Complexity, Networking, & Effects-Based Approaches to Operations," DoD Command and Control Research Program, Washington, DC, (July 2006).

^{iv} Research by John D. Bransford and Daniel L. Schwartz highlight the adaptive importance of people's willingness to seek others' ideas and perspectives. See also John D. Bransford and Daniel L. Schwartz, "Rethinking Transfer: A Simple Proposal With Multiple Implications," *Review of Research in Education*, 24(61), (1999): 83.

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